Good afternoon.

During this session I would like to take the opportunity to present two ISO programs that are currently focused on large-scale distributed agent technology as applied to the domain of logistics.

Agents, as many of you know, are goal oriented autonomous software programs that cooperate and coordinate to accomplish tremendously complex activities... often capable of proactive behaviors, mobility, persistence, flexible adaptivity and dynamic learning.

The first program I would like to talk about is the advanced logistics project, or ALP, which is entering its final year of development.

ALP has developed a revolutionary new agent architecture which has been demonstrated to be very powerful, highly scalable, and capable of doing in minutes what it takes humans weeks to accomplish.

Those who have heard me speak before know I love to talk about the Advanced Logistics Project... but because of time we have decided to present the executive summary video clip of ALP... which should convey an equal amount of information in about half the time, and probably be far more entertaining.

After this 8-minute video, I'm going to tell you little bit about another program that is just starting up called UltraLog.

The UltraLog project will be based upon the revolutionary Cougaar large-scale distributed agent technology... the primary product of the ALP development effort... but will be looking specifically at issues of survivability of agents under extremely chaotic environmental conditions... specifically wartime environments like those of a major regional contingency.

But first let's understand the vision, technical foundation and accomplishments of ALP.

Can we roll the video please?

(ALP Video)

So I hope the video provided you some good insights into what the Advanced Logistics Project is all about and what it has accomplished over the last three years.

I'd like to say a few more words about the ALP architecture before we talk about UltraLog.

The ALP architecture is both a technology and a methodology for tackling massive scale problems. The underlying cognitive model provides the fabric for elegant, distributed solutions supporting patterns of cognitive processes for decomposing and expanding tasks... allocation of tasks to resources... dynamic information management ... and assessing complex situations during execution.

Using good component technology design, the actual domain behaviors, information models, and domain knowledge of these agents are left up to the application developers.

Through the PlugIn, these modular units of domain behavior, any technology, technique, or contemporary application can be applied to any piece of the problem.

The architecture provides a powerful glue for constructing complex systems out of a variety of these PlugIns.

Except in ALP, the architectural glue also takes care of the fine-grained information management, workflow management, communication, agent negotiation, activity coordination, persistence, and a whole host of other core capabilities.

The large-scale distributed agent technology... developed completely in Java... which resulted from ALP effort has exceeded even our wildest expectations, and is now available Open Source as Cougaar, the Cognitive Agent Architecture.

Being in an open source arena, we are hoping that the agents community, both academic and commercial... will benefit from the strong starting point we have established... and move forward to work on the harder and more significant problems faced by the community.

It is our firm belief that far too much time is spent reinventing the core capabilities of agent architectures, and not enough on the important research issues and building meaningful large-scale agent applications.

Hopefully, by building a community around Cougaar we will further support the transition of this innovative DARPA technology.

In addition to our Open Source activities, we have a number of exciting pilot programs that are using the Cougaar technology... at DLA, within the services and under commercial activities.

While there is a great deal we have accomplished under ALP, there remain some significant research challenges in using agent technology "in the wild ".

It is from this realization that the UltraLog project was born.

UltraLog is going to focus on taking the agent architecture foundation from ALP... expanding and evolving it in ways that will make it ultimately survivable under the most extreme kinetic and information warfare environments.

Using the ALP technology, it's possible to create massive systems of thousands of distributed agents... managing millions of items and thousands of business processes... all communicating and coordinating across the globe using standard Internet communications protocols and standard hardware platforms.

The challenge is, that in a wartime situation, this environment may become very unstable... and we need to ensure that we can accomplish

the mission of logistics... even under extreme conditions... which is to support the warfighter.

By the end of the UltraLog project, we will be able to support a very large society of agents... at least 1000... operating effectively in a major regional contingency for at least 180 days... during which they're going to be subjected to constantly changing requirements and situational conditions... failures and complications of all forms ... frequent information warfare attacks... infrastructure loss... information corruption... and chaos of a frequency and magnitude seen only in the most extreme environments.

UltraLog will prove the survivability and effectiveness of the extended Cougaar distributed agent technology by having minimal capabilities loss and an acceptable performance degradation.

For purposes of the UltraLog challenge, we have defined this as not more than 20 percent capabilities loss, and not more than 30 percent performance degradation.

A truly ambitious DARPA caliber goal.

So the operational concept of the UltraLog project is to start with the core technology of ALP... this Cougaar architecture... and extend it in various ways to make it more robust, more secure, and more scalable.

Through these extensions we hope to achieve battlefield grade tolerance... wartime logistics scalability... and the advanced military grade security of a caliber necessary to counter the effects of kinetic warfare... information warfare... and potentially saturating chaotic environmental effects.

If we're successful, then we will have created an infrastructure unlike any other, one that is extremely adaptive... resilient under attacks of any form... highly survivable... and guaranteed stable under even extreme conditions.

While ALP enabled a revolution in the way we do logistics, UltraLog will enable a revolution in the way we survive wartime conditions and will continue to provide effective logistics support for the warfighter.

One of the most interesting challenges is exploring and exploiting the features and capabilities that agent systems provide, which conventional architectures cannot.

By their very nature, agents can be dynamic, adaptive, and proactive ... they can learn from the interactions with their environments... both from successes and failures... they can coordinate in order to share information and accomplish very complex activities.

These features, and the distributed nature of agents, enable interesting new approaches to security... robustness... and scalability that we plan to fully explore.

As part of UltraLog's ongoing development, experimentation and evaluation effort, the project will establish a significant

experimental infrastructure and operating environment for the continued development and testing of these new technologies.

While it is impossible to completely simulate the environment of a Major Regional Contingency subjected to extreme information warfare and kinetic attacks... it is expected that the project's experimentation and evaluation will occur in a reasonably close approximation.

Results from testing in this environment will provide valuable insights and allow further refinements to the ongoing efforts of the project.

So with the UltraLog concept in mind, let's take a look at where we stand under ALP and were going in the future with UltraLog.

The current ALP technology has a number of mechanisms built-in for basic fault tolerance, commercial grade security, and peacetime logistics scalability.

We are very proud of these accomplishments, in addition to all the other power capabilities of the architecture... but for UltraLog we need to go far beyond this to ultimately achieve battlefield grade tolerance... advanced military grade security... and wartime logistics scalability.

We have a pretty good idea of some of the emerging technologies that can be brought to bear to accomplish this... but adopting these emerging technology solutions to a distributed agent environment presents a number of difficulties.

In addition, we hope the responses to our BAA will provide a rich collection of new ideas on how to innovatively leverage the agent paradigm to accomplish what is not currently possible under conventional architectures.

In the end, we need a layered, integrated approach synergizing a whole host of technologies to produce an infrastructure that is highly survivable... resistant to all forms of attack... and extremely stable.

The UltraLog BAA 00-46 was officially published on July 14th, and we held a successful bidder's conference on August 18th.

The presentation material and a streaming media webcast of the Bidder's brief are available online from the DARPA BAA 00-46 page.

The first round of proposals are due in on September 20th, and I expect we will make awards in the first quarter of FY 2001.

The BAA will stay open through June 2001, and we are always looking for new and cutting edge technologies to improve the Cougaar architecture.

Again, the goal of UltraLog is to enhance the Cougaar agent technology so it can support massive-scale, trusted, distributed agent systems that can survive for an extended period of time under the most chaotic wartime conditions.

If you believe you have something to offer the UltraLog project and are not currently submitting a proposal, I encourage you to visit the

listed web sites... get a copy of the Proposer's Information Pamphlet from the "Solicitations" page at the DARPA web site... or drop us a note at the address above.

Since the project is pending, its first round of proposals this month... I will not be able to discuss UltraLog during any sidebars ... but I am available to discuss the Advanced Logistics Project and the Cougaar Cognitive Agent Architecture technology... and for those of you who know me, I am always excited to talk about all our team has accomplished and the challenging transition pilot projects currently underway.

Thank you very much.